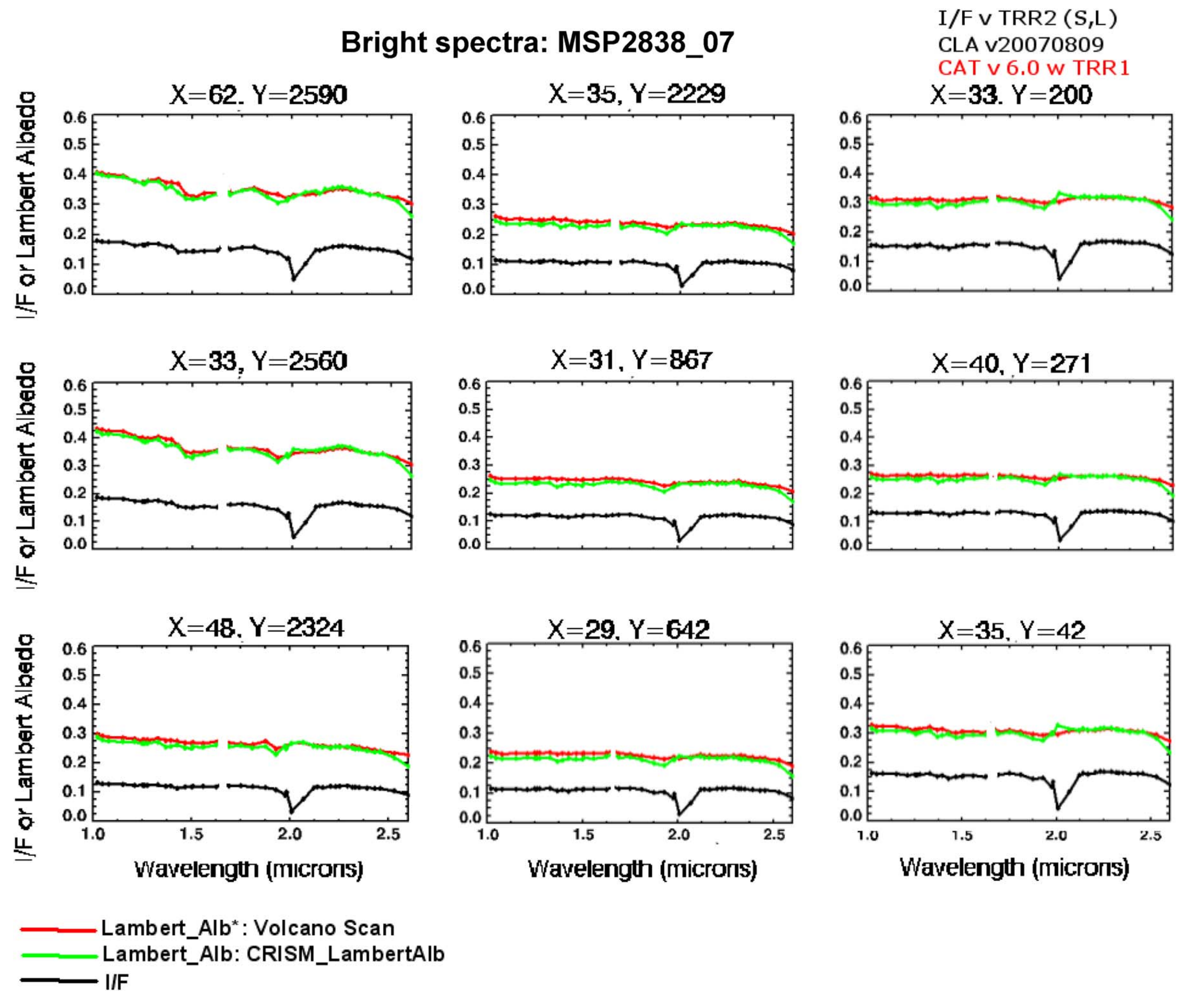

Fig. 7. We show some of the brighter L-detector spectra from the CRISM Multispectral observation, MSP00002838_07, located in the northern polar region (approximately 78°–85° N, 240° E), which are acquired on September 30, 2007 $(L_s = 114.1°)$. Only the wavelengths $< 2.6\ \mu$m are shown here. The black traces are the measured I/F spectra; the red traces (Lambert_Alb*) are the quasi-"Lambert albedo" spectra atmospherically corrected by the Volcano-Scan technique and photometrically corrected by dividing by cos(INC); the green traces (Lambert_Alb) are the Lambert albedo spectra atmospherically and photometrically corrected by the DISORT-based technique discussed in this paper. The X, Y coordinates in the multispectral image are indicated; X values near 32 are in the central portion of the 64-column image; Y values near 2700 are in the northern areas of the 2700-row image, where there is a moderate abundance of ice grains detectable in the spectra. The artifact near 1.65 μm is due to the filter boundary in the CRISM instrument, which has been removed from these spectra, for clarity. The deep atmospheric CO_2 absorption is well corrected by both techniques. The offset in Lambert albedo between the two correction techniques (i.e., between 1 and 2 μm) is caused by aerosol optical depths being explicitly handled by the DISORT-based technique and not handled by the Volcano-Scan technique.

observing conditions for a number of different TRDR strips and then map-projecting these strips onto a common grid, we construct a "map tile." CRISM has 1964 map tiles that span the surface of Mars.

We show a portion of one map tile for Tyrrhena Terra in Fig. 9, both prior to correction and after correction for the different observing conditions in each orbit. The three bands chosen for the false-color image of the map tile are as follows: the blue band at 0.86 μm, to assess aerosol correction; the green band at 1.92 μm, for surface hydration mapping; and the red band at 2.01 μm, for evaluating the quality of the correction in this CO_2 gas band. This is a particularly challenging set of wavelengths to use, given the proximity of two of the bands (red and green) to the CO_2 gas bands at 2.0 μm, as well as the blue band being at a wavelength (0.86 μm) that is strongly affected by aerosols. For this map tile of Tyrrhena Terra, the Lambert albedo version has significantly better continuity between the different TRDR strips than does the I/F version. Indeed, the I/F version of the map tile has a few strips that are rather blue in color, which is caused by the uncorrected aerosols. Furthermore, the I/F version of the map tile has a significant amount of optical distortion known as spectral smile in the CO_2 gas band near the edges of many of the TRDR strips. We explicitly correct for this spectral smile in the major CO_2 gas bands by computing special DISORT ADR-AC LUTs for the off-axis imaging in these gas bands. Hence, this smile-induced distortion in the gas bands is largely absent in the Lambert albedo version of the map tiles.

D. Map Tiles Near the Phoenix Lander 2007 Landing Site

Lastly, in order to show the performance of the CRISM_LambertAlb system in an area of Mars where the atmosphere and surface are somewhat more variable, we have made a map tile of a number of CRISM MSP TRDRs over the regions around the planned Phoenix Lander 2007